

Application Serial No. 09/470,697
Amendment A
Attachment B
Clean Version of Substitute Specification

We claim:

1. A system for circulating blood in a heart comprising:

a cannula body having a distal end for insertion through an incision and including first and second interior flow paths to circulate blood,

a conduit communicating with one of the first and second flow paths and being sized to extend, in use, beyond the distal end of the cannula body for passage into a heart chamber, to thereby input or outflow blood from the heart chamber, the cannula body including a first curved portion to direct passage of said conduit from the distal end into the heart chamber, and

a port communicating with the other one of the first and second flow paths to input or outflow blood at the distal end.

2. A system according to claim 1 and further, wherein the cannula body includes a second curved region to direct the passage of a second conduit into a second heart chamber.

3. A system according to claim 1, wherein the pump, the first flow path, and the second flow path have a combined a priming volume external of the heart of not greater than about 1000 ml.

4. A system according to claim 3, wherein the priming volume is not greater than about 30 ml.

5. A system according to claim 3, wherein the priming volume is not greater than about 10 ml.

6. A system according to claim 1, further including a pump communicating with the proximal end of

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the cannula body and operating to circulate blood through the first and second interior flow paths.

7. A system according to claim 1 further including a closure assembly on the cannula body operating in a first condition to close the port, thereby preventing blood circulation within the cannula body between the first and second flow paths, the closure assembly operating in a second condition to open the port, thereby allowing blood circulation within the cannula body between the first and second flow paths.

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8. A cannula for access to an interior body region comprising a body defining a lumen having a distal region, the lumen including a bend in the distal region.

9. A cannula according to claim 8, wherein the lumen includes a main axis, and wherein the bend is bent at an angle between 0 and 360 degrees relative to the main axis.

10. A cannula according to claim 9, wherein the angle is between 0 and 270 degrees.

11. A cannula according to claim 9, wherein the angle is between 0 and 180 degrees.

12. A cannula according to claim 1, wherein the lumen includes first and second bends in the distal region.

13. A cannula for access to an interior body region comprising a body defining a lumen having a distal region, the lumen including at least a two-dimensional configuration in the distal region.

14. A cannula according to claim 13 including deformable flexible wire disposed within the body to form the two-dimensional configuration.

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15. A cannula according to claim 13 including a memory shape alloy disposed within the body to form the two-dimensional configuration.

16. A cannula according to claim 13 including multi segmented wire with resistive sensitive connectors disposed within the body to form the two-dimensional configuration.

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